

WHAT IS CLAIMED IS:

1. An electrically-conductive thermal insulator comprising:
an electrically-conductive material defining a plurality of cells interspersed throughout the electrically-conductive material; and
a cured thermally-insulating material, said thermally-insulating material substantially coating said electrically-conductive material and substantially filling at least some of said plurality of cells in said electrically-conductive material.
- 5 2. An electrically-conductive thermal insulator as claimed in claim 1, wherein said plurality of cells is substantially interconnected.
3. An electrically-conductive thermal insulator as claimed in claim 1, wherein said electrically-conductive material is an electrically-conductive open-celled metallic foam material.
4. An electrically-conductive thermal insulator as claimed in claim 1, wherein said electrically-conductive material is formed of a plurality of substantially interconnected electrically-conductive ligaments.
5. An electrically-conductive thermal insulator as claimed in claim 1, wherein said thermally-insulating material is a polymer-based thermally-insulating material.
6. An electrically-conductive thermal insulator as claimed in claim 5, wherein the polymer-based insulating material is a silicone-based thermally-insulating material.
7. An electrically-conductive thermal insulator as claimed in claim 5, wherein the polymer-based thermal insulating material has glass microballoons dispersed substantially throughout.

8. An electrically-conductive thermal insulator as claimed in claim 5, wherein the polymer-based thermal insulating material has ceramic microballoons dispersed substantially throughout.

9. A method of forming an electrically-conductive thermal insulator comprising the steps of:

coating an electrically-conductive base material defining a plurality of interconnected cells throughout with a curable thermally-insulating material such that said
5 curable thermally-insulating material substantially coats said electrically-conductive base material and substantially fills at least some of said plurality of cells in said electrically-conductive base material; and then

curing said thermally-insulating material.

10. A method according to claim 9, further comprising the step of: prior to coating, forming said electrically-conductive base material into a desired shape.

11. A method of forming an electrically-conductive thermal insulator comprising:

interconnecting a plurality of electrically-conductive ligaments such that the plurality of interconnected, electrically-conductive ligaments form a structure defining a
5 plurality of substantially interconnected cells throughout and said plurality of interconnected electrically-conductive ligaments form a plurality of electrically conductive pathways;

applying a thermally-insulating material to said structure, said thermally-insulating material being curable and having a viscosity when uncured such that said uncured
10 thermally-insulating material substantially coats said structure and substantially flows throughout said structure substantially filling a plurality of said plurality of substantially interconnected cells; and then

curing said thermally-insulating material.